Seeds of Diversity

Iowa DNR Prairie Resource Center Fall 2013

Shaking Up Prairie Management

By Lucas Straw

It is early May, a sunny day with a light but steady wind, and the Rh is quickly dropping. You are leading your burn crew towards the burn unit planned for today; a diverse prairie reconstruction, or maybe a high quality remnant prairie that you are trying to bring back from the brink after years of neglect. When you arrive, you look over the unit to ensure that nothing has significantly changed since the last time that you burned it. The sumac (or insert your favorite shrub/tree species here) patch that you have been battling is starting to bud out and looks to be as healthy as ever. The willows on the wetland edge seem to have spread ever further. You don't notice any spring forbs in bloom, in fact you haven't seen any since the cattle came off the site and you started burning it in the late spring ever few years. And when you walk through the fuel to check the ambient moisture, you have trouble even locating a forb stem from the last growing season through the thick tangle of big bluestem and indian grass. Something seems wrong with this nearly monoculture prairie, so you decide to revisit the management plan and call off the burn for that day. There must be a way to return the diversity to the prairie that used to be there.

After considering different management options and speaking with some of your resource management counterparts, you return to the site with your burn crew. This time, the big bluestem is beginning to bolt and the sunflowers

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Summer Burn August 2013: Mt. Tired at Brushy Creek

and goldenrods are in full bloom. It is sunny again, but a typical oppressively hot August morning. The Rh dips into the mid 40's, and there is a stiff breeze blowing. A summer prescribed fire is just what this prairie needs. You have found out that your counterparts have been conducting summer burns for years with remarkable results. You do your pre-fire briefing, give assignments, and start the fire. Once you get rolling, the characteristics of summer burns start to show themselves. Thick white smoke comes rolling off the line and the fire is snapping and popping like the intense late spring fires you conduct each year. But thanks to the high proportion of live fuels, the fire moves only at a moderate pace through the unit. It is this slow moving fire, coupled with the typically dry summer conditions and intense heat that are the secret to a summer fires success.

Summer fires move slowly and with tremendous amounts of heat. This combination, along with the fat that tree and brush species have moved much of their root reserves above ground to produce lush summer growth spells a perfect storm for woody species control. The slow moving fire cooks (or in some cases just burns off) the leaves and boils the cambium layer, permanently cutting off the plants pathway to store food. The leaves, if not burned right off the plant during the fire, will remain green for a day or two before turning brown. But, touch them and they crumble in your hands. Likewise, native warm season grasses are similarly affected. When burned while bolting, they lose valuable resources located above ground, reducing root re-

The after effects of a summer burn, one month later. The trees along the savanna edge were affected with greater intensity.

serves further and therefore they reduce the soil space that their roots take up. This makes the soil openings that other plants require to expand.

You wrap up your burn and debrief the crew. You do your final inspection of the unit before leaving, and notice that not all of the brush seemed to be affected. Where there was not adequate fuel, the fire did not seem to be effective. The brush in the areas that did burn seems to be extremely stressed, if not black from the heat and flames. The bluestem bolts that did not burn are likewise yellowed and laid over. You chock it up as a success and pack up.

While monitoring the unit over the next year, you begin to notice the changes you were hoping to accomplish with the summer fire. The plant community shifts, not only in species abundance, but in diversity as well. The brush is still present, but at a fraction of the abundance it was before the burn. Many of the smaller brush patches are not resrouting at all, while the larger ones have some individuals that were not affected, and the root reserves of the clump were great enough to allow some of the outer individuals to resprout. The big bluestem and indian grass are both still present, but it only gets to a few inches to a foot tall that fall, and seems sparser than before. The next spring, you discover that pasque flower, blue eyed grass, prairie violets, and a myriad of other spring ephemeral forbs are again blooming in abundance in the unit for the first time in years. And as the year progresses, you see a proliferation of forbs taking advantage of the space abandoned by the weakened grasses. A short term loss in abundance of the mid-summer grasses and blooming forbs leads to a long term gain in biodiversity and structural heterogeneity in the prairie. The result, a win for the prairie and the fauna that it supports.

Oak tree re-leafing after a summer burn.

Species Spotlight: Downy Gentian

By Sarah Nizzi

One day in late September a fellow AmeriCorps member and I were doing what we spent much of the fall doing, hand harvesting, and we came across a gem of a species in one of our nearby remnant prairies on Brushy Creek. The remnant is nicknamed "Root Cellar" and can be quite a spectacular sight mid-summer with many blooming forbs and grasses. On this particular day nearly all the native species had gone to seed and were beginning to phase into senescence. As we walked carefully into what appeared as a simple fall remnant we stumbled upon a species neither one of us had seen before, the Downy gentian (*Gentiana puberulenta*).

The Downy gentian is in the family gentianaceae and is a perennial native species known to inhabit dry-mesic prairies as well as woodland areas thorough out the Midwest and into Canada. The flowers are of a bluish purple color with a funnel-like shape and bloom from August to October. There are other fall blooming gentians, but the Downy can be identified separately by the flaring or funnel-like petals, the color of the petals, and the white anthers. This species has also been spotted as having white petals with blue nectar guides. But if one is not aware when walking through an area they might walk right on by, because Downy gentians only grow 8-20 inches tall. Despite being short and sometimes hidden the Downy gentian is a native ranking as a nine on the coefficient of conservatism scale. A high ranking such as a nine translates that this species is an indicator of a high quality prairie or woodland.

If you were ever under the assumption that prairies seem rather plain, dull, or perhaps monotone in color come late August into October you might be missing out on something special. When fall rolls around again next year and you find yourself on a hike or perhaps scouting out the perfect spot for your deer stand take some time to look down and just maybe you'll see some small rays of blue amongst the golden color of autumn.

A New Method for Producing Wildflower Seed

By Bill Johnson

One of the many challenges for the Prairie Resource Center is meeting demand for seed annually. Yearly seed order range from 1500-2700 acres, but the last 3 years demand has been at its highest with between 2500-2700 acres of prairie seed requested. One of the most difficult components for us to provide to those acres has been the wildflower (forb) seed. All forb seed produced from our plots is planted the following year, with no carry over seed. In order to remedy the need for forb seed, the Prairie Resource Center is embarking on a new method for producing forb seed.

There are many species of forbs native to the Iowa's prairie. Seed production in our plots varies each year with rainfall, age of the plot, disease issues and etc. Some of the early successional species to the prairie act similarly in the plot and do not produce seed for more than a 2-3 year period. This has caused a lot of labor being utilized on these early successional species with a boom one year in seed production followed by a drastic downward spiral of seed production. The Prairie Resource Center is trying to take some of the early successional species that establish easily by seed and grow them in a field with a cover crop of Little bluestem or Side oats grama. The native grass will work as an extra competitor for weeds and a conduit for fire use in the plots. Stemmy materials tend to burn poorly and the native grass addition will help the fire perpetuate itself across the field. One of the attributes of fire is reducing some of the diseases that affect the forbs, while also removing the residue from the

previous year, thus enhancing flowering and seed production. One of the other benefits is that seed is planted in a 20 foot strip, thus allowing harvest by our combine versus the hand harvest of the past.

Early results show success with species such as Oxeye (False sunflower), Partridge pea, Rattlesnake master, Golden alexander, and Prairie blazing star. All of these species were machine harvested this year except for the Prairie blazing star which was hand harvested in the direct seeded plot area.

Some of the struggles have been perennial weeds (Goldenrod species) that have gotten established in the direct seeded plot areas, but it is hoped that some of them will diminish as the planted native forbs improve their establishment.

Total success may not be known for a couple of years. There are several questions that only future results can answer. Staff at the PRC has remained the same since its inception in the fall of 2000. We are at our limits on seed production/labor threshold with our "old" methods, so we are trying innovation for seed production in the future. Hopefully, this will level some of the boom/bust seed production of native forbs and improve on meeting the needs of the Iowa DNR.